



ATD-2 Integrated Arrival/ Departure/Surface (IADS) System Software Version 3.1.x Releases and Notes

Cynthia J. Freedman

Universities Space Research Association (USRA) - NASA Academic Mission Services (NAMS)

NASA Ames Research Center, Moffett Field, CA

Louise K. Morgan-Ruszkowski

Wyle Labs

NASA Ames Research Center, Moffett Field, CA

August 2018

Table of Contents

1	Purpose	4
2	Release 3.1.0 Summary	4
2.1	Overview.....	4
2.2	Adaptation	4
2.3	AEFS	5
2.4	Backend.....	5
2.5	Dashboard.....	5
2.6	IDAC/APREQ	5
2.7	Model.....	5
2.8	System.....	5
2.9	Tactical	5
2.10	TBFM.....	6
2.11	TTP	6
2.12	User Interface: Client.....	6
2.13	User Interface: RTC	7
3	Release 3.1.0.1 Summary	7
3.1	Overview.....	7
3.2	New Features	7
3.3	Improvements.....	7
3.4	Fixes	7
3.5	Operations	8
4	Release 3.1.0.2 Summary	8
4.1	Overview.....	8
4.2	New Features	8
4.3	Improvements.....	8
4.4	Fixes	8
4.5	Operations	8
5	Release 3.1.0.3 Summary	8
5.1	Overview.....	8
5.2	New Features	8
5.3	Improvements.....	8
5.4	Fixes	8
5.5	Operations	8
6	Release 3.1.1 and 3.1.1.1 Summary.....	9
6.1	Overview.....	9
6.2	Adaptation	9
6.3	RTC	9
6.4	Scheduler	9
6.5	STBO Client.....	9
6.6	Surface Metering Display	9
6.7	WebDASH	9
7	Release 3.1.1.2 and 3.1.1.3 Summary.....	10
7.1	Overview.....	10
7.2	Adaptation	10
7.3	Dashboard.....	10
7.4	RTC	10
7.5	Scheduler	10
7.6	STBO Client.....	10
7.7	Surface Metering Display	10
7.8	Backend.....	11
8	Release 3.1.2 Summary	11
8.1	Overview.....	11
8.2	Adaptation	11
8.3	RTC	11

8.4	STBO Client.....	12
8.5	Surface Metering Display	14
8.6	TBFM.....	14
9	Release 3.1.2.1 Summary	14
9.1	Overview.....	14
9.2	Model.....	14
9.3	STBO Client.....	14
10	Release 3.1.2.2 Summary	15
10.1	Overview.....	15
10.2	Adaptation	15
10.3	RTC	15
10.4	Scheduler	15
10.5	STBO Client.....	15
10.6	Surface Metering Display	15
11	Release 3.1.2.3 / 3.1.2.4 Summary	15
11.1	Overview.....	15
11.2	Adaptation	15
11.3	Model.....	16
11.4	Scheduler	16
11.5	STBO Client.....	16
12	Release 3.1.3 Summary	16
12.1	Overview.....	16
12.2	Adaptation	16
12.3	AEFS	16
12.4	Backend.....	16
12.5	Dashboard	17
12.6	RTC	17
12.7	Scheduler	17
12.8	STBO Client.....	18
12.9	TBFM.....	19
12.10	TTP.....	19
13	Release 3.1.4 / 3.1.4.1 Summary	19
13.1	Overview.....	19
13.2	Adaptation	19
13.3	RTC	19
13.4	Scheduler	19
13.5	STBO Client.....	19
14	Release 3.1.4.2 Summary	20
14.1	Overview.....	20
14.2	AEFS	20
14.3	Backend.....	20
14.4	RTC	20
14.5	Scheduler	20
14.6	TTP.....	20

1 Purpose

Below are change reports for the 3.1.x series of releases to Charlotte-Douglas International Airport (CLT) and/or Dallas-Fort Worth International Airport (DFW). These list all the changes since the previous release. The Release Notes for Distribution are meant to be more readable by stakeholders.

Release	Release Date	CLT Deployment Date	DFW Deployment Date	Notes
3.1.0	07 Feb 2018	09 Feb 2018	n/a	
3.1.0.1	16 Feb 2018	16 Feb 2018	n/a	
3.1.0.2	27 Feb 2018	27 Feb 2018	n/a	
3.1.0.3	01 Mar 2018	02 Mar 2018	n/a	
3.1.1	07 Mar 2018		n/a	
3.1.1.1	08 Mar 2018	13 Mar 2018		
3.1.1.2	28 Mar 2018		n/a	TBFM rolled back to 4.6.1
3.1.1.3	04 Apr 2018	10 Apr 2018		
3.1.2	10 May 2018	14 May 2018	14 May 2018	
3.1.2.1	18 May 2018	21 May 2018	21 May 2018	
3.1.2.2	01 Jun 2018	06 Jun 2018	n/a	
3.1.2.3	27 Jun 2018	not deployed	not deployed	not deployed in favor of 3.1.2.4
3.1.2.4	28 Jun 2018	02 Jul 2018	n/a	Patch release for CLT
3.1.3	10 Jul 2018	n/a	16 Jul 2018	DFW-focused release
3.1.4,				
3.1.4.1	19 Jul 2018	23 Jul 2018	n/a	First cut at strategic scheduling for CLT. 3.1.4 was not fielded due to a release-cutting snafu.
3.1.4.2	31 Jul 2018	31 Jul 2018	n/a	Patch release to CLT only

2 Release 3.1.0 Summary

2.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.0. Version 3.1.0 was deployed to CLT on 09 February 2018.

Issues addressed in this version of the software are summarized in this overview by the component of the system that they impact. The appendix shows the same tasks, grouped by whether they are a new feature, an improvement, or a fix.

2.2 Adaptation

- Updated the CLT default gate decision tree
- Updated the CLT departure_runway_by_polygon_decision_tree to check spot before ramp area for north flow departures to 36R
- Updated the CLT map layer order

- Updated the DFW map for layer order, plus added runway shoulders
- Updated the D10 TRACON map files

2.3 AEFS

- Set up project

2.4 Backend

- Ensured sync messages from TBFM over SWIM are not overwriting new flight state data
- Fixed flight matching issues
- Aggregated Fuser's list of changes during flight updates to be available to consumers (e.g. TTP)
- Stored a flight's super stream data
- Stored the information for the flight being swapped with, in an APREQ swap
- Set up a Fuser Sr instance for DAL

2.5 Dashboard

- Moved business logic to SQL
- Implemented new web based Superset dashboard
- Added command line argument for whether ops or train metrics are desired

2.6 IDAC/APREQ

- Added the ability to swap flights' target times

2.7 Model

- Used flight state to determine flight order in line-of-flight
- Set arrival flights with an STA from TMA within an hour (configurable) of current clock time to be exempt from scheduling in the tactical scheduler
- Extended a) the scheduling time range from 2 hours to 8 hours, b) the trajectory modeling out to 24 hours, c) the flight table out to 8 hours, and d) the gate conflict out to 8 hours
- Created a new return to gate processor that will detect cases where a departure taxis back to the gate. It also handles cases where a controller sets the return to gate clearance.

2.8 System

- Switched to use a global configuration file for the Commander at startup
- Created a new fuser style tactical scheduler database project for analysis
- Created TFDM SWIM Engine project for TTP
- Created a metrics service component in support of TTP
- Created a new sync component that will run in place of STBO CM
- Set up metering mode email alerts

2.9 Tactical

- Fixed a bug that when a departure fix is closed (with no CDR alternate specified) with no end-time, the affected flights get pushed back on the timeline by 2+ hours. They should get removed from the schedule entirely.
- Fixed a bug that when a dep fix is closed (WITH a CDR alternate specified), with or without an end-time, the affected flights are still pushed back on the timeline (2+ hrs. if no end-time or after the end-time if it is specified) even though everything else indicates that the flights are now going through the CDR alternate fix. The flights should stay in the same place on the schedule/timeline since they have a new fix that isn't closed.
- Modified the separation library so that it can be used externally by the SOSS group to make sure their schedulers use the same separation requirements that are used by the tactical scheduler

- Created an adjusted FCFS order of consideration with enhanced groupings: Arrival/Departure, Tracked departures/Untracked Departures, and the use of a first schedule pass using FCFS to define ordering constraints for all other comparisons
- Modified queue prediction algorithm to find the closest flight in front and back to better determine the best queue prediction from those flight queue durations. (When determining a TOBT for a flight given a specifically defined TTOT, the calculation is: $TOBT = TTOT - queueTime - transitTime$. In order to determine the queue time, an algorithm is used to predict the queue at a given time.)
- Changed APREQ scheduling to schedule the flight in a FCFS manner when the APREQ has a release time and is on taxi (in the AMA area, past spot). (Previously, an APREQ with a release time was always scheduled at the release time only to be pushed back by arrival flights.)
- Modified order of consideration for departure flights. (The AMA taxi departures have the highest predictability of all departure flights. The new order of consideration for departures will be as follows: AMA taxi, APREQ, EDCT, Ramp taxi, Exempt, Ready, Planning, Uncertain.)

2.10 TBFM

- Created an SFDPS swim feed parser for TBFM. It accepts as input an XML SFDPS stream which filters to a single center facility (ZFW)
- Created a Tais swim feed parser for TBFM. It accepts as input an XML Tais stream which filters to a single TRACON facility (D10)
- Checked in the NASA CTAS Lab hadds server which has been running in the lab for many years. (The hadds_server is compiled under the TBFM directories.)

2.11 TTP

- Created TtpSchema project (still only in Mosaic Stash due to NDA) airport information and TMI Restriction schema according to TTP AirportInformation and TrafficManagementRestrictions schema
- Converted airport configuration, runway closure, ramp closure, and taxiway closers from FMC to TTP format.
- Converted APREQ, MIT, Ground Stop, and Departure Fix Closures TMI from FMC to TTP format
- Converted APREQ approval requests from FMC to TTP
- Created FlightDataService containing TFDM Build 1 elements and some Build2 elements
- Created Operational Metrics Service
- Created AirportInformationReSyncService to pull the airport configuration and runway/taxiway/ramp closures data from FMC at 15 minute intervals (configurable), transform to AirportInformationType for TTP, and publish to the destination topic with the correct start, message, and end headers included
- Created the TrafficManagementReSyncService to pull the APREQ, MIT, and ground stop restriction data from FMC at 15 minute intervals (configurable), transforms to TrafficManagementRestrictionsType for TTP, and publish to the destination topic with the correct start, message, and end headers included
- Added the ability to filter by publish data by carrier

2.12 User Interface: Client

- Added ability to swap the APREQ times of two flights in the same super stream class and APREQ mode (semi-automatic or automatic) to the Client via a flight's right mouse menu on the timeline
- Assured capability for user viewing the Client in Observer mode to see the APREQ swap candidates for an APREQ flight
- Added an ARMT-like departure delay table to the Client via the Delays button on the main toolbar. Entries in the table are color-coded based on amount of delay and whether the flight is subject to a TMI. The user can sort columns by clicking the column header.
- Made sure that the target for a flight created on RTC will also be displayed on the Client, subject to the Client's map setting for Show Flights At Gate

- Removed the ability to change a flight's gate on the Client
- Added the ability to clear and remove a color alert in the Flights Table Color Alerts settings
- Added the abilities to remove a specific row and to clear boolean and time fields in the Flights Table Filter settings
- Improved Search user interface (replaced X with Clear, plus other subtle improvements)
- Removed Close button from Flights Table
- Changed panning on the Client map to execute with left-click and drag, instead of right-click and drag
- Added the super stream data to the Flights Table
- Changed Flights Table so that a) the departure fix field only has the "old" fix it, b) "Awaiting CDR" is renamed to "Swap" and contains the CDR fix. (The Flights Table previously had a field labeled "Awaiting CDR". If a fix had a CDR, the table used to say "old fix -> cdr fix" in the Departure Fix column and "Awaiting CDR," if the CDR fix had not been set.)
- Added ability to filter by ZULU time, in addition to the current relative time, in the Flight Table filter
- Added a "Preview" button in the Timeline and Map Settings, so that the effect of settings changes can be previewed without actually applying them
- Added color field alerting for MIT in the Flights table
- Updated the Client's early/late/on-time indicator on the timeline to use TTOT (instead of UTOT) to compare with Controlled time
- Added the ability to select either inclusion or exclusion action types when applying constraints to a TMI via the TM Action panel
- Added greater error handling so that the user can't navigate away from a tab if the inclusion/exclusion ratio was not set or if the TMI constraint was not added or cleared
- Allowed the specification of single flight exclusions from a Ground Stop TMI from the Client timeline
- Allowed the specification of single flight exclusions from a Departure Fix Closure TMI from the Client timeline
- Added the source for MITs, Ground Stops, and Departure Fix Closures to the TM Actions panel and the Notification Table's Details
- Added ARMT-like departure delay table
- Added the ability to reset the What-If system from the main toolbar

2.13 User Interface: RTC

- Added a toggle "Display ADW" to RTC's map options to indicate whether or not to display the Arrival Departure Window

3 Release 3.1.0.1 Summary

3.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.0.1. Version 3.1.0.1 was deployed to CLT on 16 February 2018.

3.2 New Features

- The back end was configured to ingest data for the DFW airport.

3.3 Improvements

- No improvement changes in the software

3.4 Fixes

- In the notification window, the start time of the initial airport configuration was updated to be blank at system startup since the time cannot be known.

- The user is prevented from selecting any other flight on the STBO Client when in swap mode.
- The schedule priority for a controlled flight with a release time was corrected for the case of the flight still in the ramp.

3.5 Operations

- No change to installation or start-up procedures

4 Release 3.1.0.2 Summary

4.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.0.2. Version 3.1.0.2 was deployed to CLT on 27 February 2018.

4.2 New Features

- No new features added to the software.

4.3 Improvements

- No improvement changes in the software

4.4 Fixes

- The scheduler was updated to distribute delay for flights with a CTOT in the AMA instead of at the gate.

4.5 Operations

- No change to installation or start-up procedures

5 Release 3.1.0.3 Summary

5.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.0.3. Version 3.1.0.3 was deployed to CLT on 02 March 2018.

5.2 New Features

- No new features added to the software.

5.3 Improvements

- No improvement changes in the software

5.4 Fixes

- The Ramp Traffic Console (RTC) was corrected to properly display flights in the corner of the map which were not being displayed when the map was rotated.

5.5 Operations

- No change to installation or start-up procedures

6 Release 3.1.1 and 3.1.1.1 Summary

6.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.1 and 3.1.1.1. Version 3.1.1.1 was deployed to CLT on 13 March 2018; version 3.1.1 was not delivered.

Issues addressed in this version of the software are summarized by the component of the system that they impact.

6.2 Adaptation

- Updated airport surface routes around A-con
- Expanded departure runway decision tree to include aircraft type
- Trimmed runway detection polygons for North flow operations to reduce false detections

6.3 RTC

- Display metering mode icons in the status bar on a per-runway basis
- Ability to mark flights as medical emergencies
- Removed setting of metering mode (transferred to SMD)
- Display indicator* on zoomed out strips that a flight has a scratch pad entry (*a white box, similar to the TMI yellow box)
- Data tags can be moved independently from the icon when the flight is away from the gate
- Displays a watermark when previously-triggered time based metering is now un-triggered
- Displays the Air Start marking (red box) around gate labels

6.4 Scheduler

- Updated pushback duration times based on data from the field
- Added metering parameters to control the size of the OUT queue
- Meter flights on a per-runway basis
- Initial support for DFW

6.5 STBO Client

- Display metering mode icons in the status bar on a per-runway basis
- Added ability to mark flights as medical emergencies
- ARMT-like departure fix load balancing table
- Expanded MIT restrictions to allow restrictions based on destination or jet route
- Removed B757's from the Heavy type (but still have the blue border on RTC)
- Displays the gate name instead of UNK, if set by decision tree for DFW

6.6 Surface Metering Display

- New display accessible from a web browser to access surface metering parameters.

6.7 WebDASH

New version of the Dashboard accessible from a web browser. The previous Dashboard application has been retired.

7 Release 3.1.1.2 and 3.1.1.3 Summary

7.1 Overview

This document describes the changes to the ATD-2 software baseline for versions 3.1.1.2 and 3.1.1.3. Version 3.1.1.3 was deployed to CLT on 10 April 2018. (Version 3.1.1.2 was not deployed.)

7.2 Adaptation

- Updated the ramp taxi speed decision tree.
- Updated the runway detection polygons for flights in the C concourse.
- Updated the background map to reflect changes at CLT: in E-con, covered walkways are at right angles now. Modifications were also made to the gates and gate labels at the end of E concourse to match the building changes. Cargo ramp at C8 is also different. There is no connection at C8, C7 anymore; spot AC_4 does not exist.
- Restored spot 9 as the ramp/AMA transition spot instead of 8W and 8E.

7.3 Dashboard

- Updated the Quick Look's Arrival/Departure Rate panel to reflect the current arrival/departure rates at CLT.
- Updated the Predicted Excess Queue Time query to include only flights in next two hours.
- Added a data quality page to System Monitor (per machine) to display a summary of the data feeds and their current status.
- Sorted the legend alphabetically in the Taxi In/Out Monitor charts so that they match order and colors between slices.

7.4 RTC

- Changed the Push 10 and Hold gate E6 to E8.
- Added the white rectangle that indicates the flight has a scratchpad entry to any flight icon/disk if the full scratchpad text is not displayed.

7.5 Scheduler

- Updated the metering off algorithm to take into account actual queue length to address problems of ballooning and fluttering.
- Added properties to automatically exempt international and heavy flights from metering. A flight is considered heavy if the weight class matches either: SUPER, HEAVY, A, B, C. Only flights in the ramp area or at a gate that match one of these criteria will be exempt from metering.

7.6 STBO Client

- Added Departure Fix as resource option to the APREQ TM Panel.
- Renamed "Delays" to "Taxi List".
- Updated the arrival count in the Taxi List to count arrivals within the Terminal Airspace; the time interval is only applied to departures.
- Added runway labels to the Taxi List displays.
- Added a Total Runway Demand to the Taxi List displays.
- Updated the runway timelines to display departures at the start of roll time instead of OFF time.
- Updated the selection of top departure destinations for DFW.

7.7 Surface Metering Display

- Updated the Airport Excess Queue Time plot to show the target excess queue time for each runway on that plot. The target threshold lines are displayed with the same coloring as the runway and have a label for the runway it represents.

- Added a simpler view of the data for the active configuration by adding a static table to the metering parameters page that provides a few of the metering parameters for the currently active departure runways. The panel was changed to a tabbed-pane format for setting the metering mode parameters and switched condensed runway pairings into single tabs.
- Renamed the "Clear All Parameters" button to "Clear [X] Parameters" where [X] is the runway name on the metering parameters page.
- Added a small notification overlay that times out after a couple seconds when the user submits new metering parameters to indicate whether or not the request was successfully sent.
- Added a clear button on the parameter display that will wipe out any user entries and remove any styling on the airport and runway metering panels.

7.8 Backend

- Changed to ignore gate time from TBFM.
- Changed to ignore routes from TBFM if a route has been received from TFM.

8 Release 3.1.2 Summary

8.1 Overview

This document describes the changes to the ATD-2 software baseline for versions 3.1.2. Version 3.1.2 was deployed to CLT and DFW on 14 May 2018.

8.2 Adaptation

- Removed the 18C runway detection polygon at the top of the west hardstand. This resolved the problem by which flights in the west ramp, bound for 18L, could push back, go around the top of the west hard stand, and have their runway changed to 18C.

8.3 RTC

- Changed the green repo indicator to show at higher zoom levels on both the strip and the gray disk.
- Added gates A9 and A11 to the list of gates marked with a red box.
- Added the ability to flag a flight as requiring Air Start to the right mouse menu. Once flagged as Air Start, the engine icon will appear with a red outline. The icon is not a button, only an image. Once pushed back, the icon border will change to yellow and the icon will become a button as normal.
- Added A14 alerting for arrivals that are on the surface, but not yet at the gate. The A14 alert is displayed at all zoom levels. The alert is displayed as:
 - Nothing, if the flight is before its scheduled IN time or if the scheduled IN time is not available.
 - "A0" in black on white, if the flight is between 00:01 - 05:00 after its scheduled IN time.
 - "A5" in black on yellow, if the flight is between 05:01 - 14:00 after its scheduled IN time.
 - "A14" in white on red, if the flight is 14:01 or more after its scheduled IN time.
- RMTC only: Added A14 timer display indicating the actual time past scheduled IN time for arrivals that are on the surface, but not yet at the gate. The A14 timer is displayed at zoomed in or bloomed levels only.
- Added the ability for a departure strip at the gate to be removed.
- Added the ability, via the Flight Menu, to change back a runway that was originally changed due to operational necessity; previously, this was not allowed.
- Added options to choose a reposition location of "Hanger" or "South Cargo" when marking a flight for reposition. If selected, the reposition indicator reflects the chosen location and the strip will be moved to that location on all RTCs.
- Improved the ability to drag data tags:

- For a solid icon with a draggable tag, the tag should be draggable from any part of the data tag. Note that for hover this will only work for the smaller hover zone that causes the bloom. On selection, with permanent bloom, dragging can be done from any part of the tag.
- Strips can now also be dragged and rotated without first having to select, though again, this only works while in the hover bounds. On selection, the whole tag can be interacted with. For example, hover over a strip. The circle should be visible. Find a part of the unbloomed strip that would be outside the circle and drag it. This should rotate the strip without an intermediate selection. Dragging from an area of the unbloomed strip that is inside the circle should result in the strip being dragged.
- Corrected a problem where an impending gate conflict was shown for an arrival flight regardless of the gate conflict display threshold setting.
- Changed the display on a strip for some instances when a departure fix is closed:
 - If a fix is closed with an alternative, the original (closed) fix will show in the strip with a yellow highlight, indicating to the controller that the pilot needs to be told to call Clearance Delivery. Previously, the alternative fix was displayed on the strip.
 - If a fix is closed with no alternative, the original (closed) fix will be highlighted in red in the strip.
 - Once the route is changed, the new departure fix is displayed in the normal strip color.
- Filtered cancelled flights out of the arrival list.
- Corrected a problem with the arrival list where ETAs for multiple flights displayed as 2359.
- Changed cancelled flights to be removed after 2 hours instead of 4.
- Corrected the priority list so that flights that have already departed or are from the past will no longer be included in the list.
- Added an "A", "E", or "Q" at the end of the TMACT time to indicate if a flight has an APREQ, EDCT, or both, respectively.
- Made changes to improve gate conflict detection:
 - Previously if an arrival had an actual IN time with no following departure, the arrival data tag would no longer be displayed after 30 minutes (domestic) or 75 minutes (international). Now, the flight will continue to be displayed until it is deleted from the system or the controller manually deletes the data tag, whichever comes first.
 - A pair of flights with a gate time which are more than an hour apart are no longer considered to be related when at least one of them does not have a tail number set.
 - A flight which is not considered to be the current leg of the flight will not be considered in gate conflict detection logic.

8.4 STBO Client

- Changed the red/green slot availability graphics on the timeline to display when a flight is selected from the Flights Table or map. Previously, these graphics were only displayed when a flight was selected from the timeline.
- Added ability to modify TMIs if a USER was the original source. Elements that may be edited:
 - Configuration: runway utilization, meteorological condition, and start time (future configurations only)
 - APREQ: constraints, start time (future APREQs only), and end time
 - MIT: in-trail restriction, constraints, start time (future MITs only), and end time
 - Departure Fix closures: CDR fix, constraints, start time (future closures only), and end time
 - Runway closures: start time (future closures only)
 - Ground Stops: constraints start time (future ground stops only), end time

In addition, the View Constraints button now only shows the constraints for the TMIs listed in the TMI table. The constraints for a currently-being-added TMI is now displayed in its own text field on the data entry panel.
- Corrected the colored display of the resource for a MIT restriction. The MIT restriction can have a resource of an airport, departure fix, or jet route. When a MIT is established, previously the Flights Table colored only the departure fix field, even if the MIT resource was an airport or a jet route. This has been corrected so that if the MIT resource is an airport,

then the destination column is colored, and if the resource is a jet route, then the route column is colored.

- Enhanced the ability to reschedule flights. For any flight subject to an APREQ TMI, the following options should always be available:
 - "Request Release Time": sends the flight's CTOT as the requested time
 - "Select Slot on Timeline": sends the time the user selects on the timeline
 - "Set Release Time": the flight is immediately assigned the user entered time

The only time these options would not be available is if the flight is in the middle of swapping or if a negotiation request is pending. If the previous release time is different than the new release time, the yellow icon is displayed next to the flight datablock.
- Updated the Set Release Time dialog so that the cursor is automatically placed in the time field, allowing the user to begin typing immediately.
- Excluded flights from swap eligibility when negotiation was performed using the "Set Release Time" menu option.
- Renamed the "Cancel APREQ Swaps" right-click menu option to "Exit APREQ Swaps View" in Observer mode.
- Added the ability to suspend and unsuspend a flight to the flight's right mouse menu.
- Added a "Return To Ramp" option to the right mouse flight menu. The option is enabled for departures that are in the AMA. A flight with this status set will be removed from the schedule. Once set, this option can be cancelled to return the flight to a normal, schedulable state.
- Fixed a problem for PDT flights whose departure fix was updated to ESTRR after taking off even if the flight plan still has a SID or other recognizable fixes.
- Changed the display of the airport identifier to be the 4-letter ICAO identifier for international flights and the FAA LID (instead of IATA) for domestic flights. For example, Hilton Head will now display HXD (FAA LID) instead of HHH (IATA).
- Updated the default set of fixes displayed in the departure fix table:
 - Primary demand departure fixes are displayed by default and are ordered based on direction.
 - Lesser demand departure fixes are not displayed by default; if shown, they are displayed alphabetically after the primary demand fixes.
- Updated the settings file so that departure fix table configuration can now be saved in the file.
- Changed the Duration labels from "Start time (min)" to "Begin at (min relative to Ref)", and from "End time (min)" to "End time (min relative to Ref)" in the timeline settings dialog. Note that the begin or end values should be negative to display times in the past.
- Updated the colors for the Departure Fix color scheme for DFW.
- Updated several groups of TRACON video map files for the D10 and CLT TRACONS.
- Added a Flight Plan Demand feature to the timelines. Using the timeline right mouse menu, select Flight Plan Demand. After entering a start and end time, selecting the "Show" button, and clicking Apply, a white box will be drawn on all displayed timelines around the user-entered time range. At the base of each timeline, a label will be displayed showing "<num_arrivals>/<num_departures>" for the number of arrivals and departures using that timeline's runway in that time range. The label for arrivals will be gray and the label for departures will be green, regardless of the color scheme selected for the timeline. As the start time of the window becomes the current time, the start time of the demand view automatically updates the start time to be the current time, shrinking the window. If the end time is reached, the demand view is automatically turned off. To turn off the demand view before the end time, open the Flight Plan Demand dialog and de-select the "Show" checkbox.
- Updated the connection between STBO Client and the What-If system, such that if the Flight Plan Demand feature is being drawn on an STBO Client and if a What-If system is connected to the same back end, then a Flight Plan Demand will automatically be activated on the What-If system using the same time range as the master STBO Client.
- Corrected a problem when using the departure gate color scheme, where flights departed on the timeline turn to a faint gray or flights on the map turn pink.
- Updated the Arr/Dep color scheme for DFW to display arrivals in white.
- Updated the Departure Gate color scheme for DFW so that the "no gate" default color was changed to be less like the West gate color. Cancelled flights are now removed after 2 hours instead of 4.
- Corrected a problem with B75x aircraft displaying as Heavy.

- Added the ability to set a flight's runway due to operational necessity to the Flight Properties dialog, which is useful during periods when the configuration is changing.

8.5 Surface Metering Display

- Updated the SMD Metering Parameters page to have controls for sequence based metering. The radio button for metering mode was changed from options of "ENABLED" and "DISABLED" to instead have the options: "No Metering", "Sequence-Based Metering", and "Time-Based Metering." If the user selects "Sequence-Based Metering" then a new row in the airport-wide parameter section containing "Sequence-Based Target Queue" will be shown.
- Modified the display so that:
 - The parameters page was tabulated so that each runway is in its own tab.
 - User changes can now be viewed across tabs.
 - Changes for all tabs can now be submitted at once.
- Added the last time parameters to the display.
- Changed the menu bar selections to have white text and icons to better indicate that they can be selected. On mouse-over, the menu items will also show with an underline to further indicate user action can be taken.
- Added a slider bar to the left side of the excess queue time chart which will allow the user to filter outliers from the display. The default range of the slider is 0 to 180 minutes. When the slider bar value changes, the y-axis of the excess queue time chart will automatically update to the slider's value. If any data points are hidden because of the slider bar range, a warning icon with the message "<n> Hidden" will appear above the slider bar, indicating the number of points that are no longer visible due to the selected range.

8.6 TBFM

- Fixed a problem where selecting "Streams..." from TGUI F1 panel was causing TGUI to crash.
- Updated the 3_S_SIM_ILS's 18C separation to be the same as 18R's and 3_N_ILS's 36C separation to be the same as 36L's. This was to address a problem in which controllers reported that the arrival flights that were tactically directed to 18C/36C had a much larger scheduled arrival separation on the timeline than expected. They expected 6 miles, but it appeared to be scheduled at more like 10 miles. This was occurring because, in the ILS operation, the 18C configuration still had the default TBFM wake vortex of 10 miles.

9 Release 3.1.2.1 Summary

9.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.2.1. Version 3.1.2.1 was deployed to CLT and DFW on 21 May 2018.

9.2 Model

Increased the Gate Conflict detection window with arrivals after IN to 8 hours. To support this, the amount of time arrivals are retained in the system after IN was also increased to 8 hours.

Updated the monitor for the active airport configuration to exclude flights with an OpNec-assigned runway.

9.3 STBO Client

Corrected problems in the Departure Fix Status table which caused the Count row to not equal the sum of flights in the 1-15 and 16-30 flight bins.

Corrected an intermittent problem occurring when adding a new TMI that erroneously displayed "Start Time Expired".

10 Release 3.1.2.2 Summary

10.1 Overview

This document describes the changes to the ATD-2 software baseline for version 3.1.2.2. Version 3.1.2.2 was deployed to CLT on 06 June 2018.

10.2 Adaptation

Updated default taxi routes such that departures going to 18C will exit the ramp at spot 8 instead of 9. In addition, if a flight exits the ramp at spot 9, the default route will go north on taxiway E, then re-enter the ramp at spot 8 and continue north through the expanded west ramp.

10.3 RTC

Corrected to display a gate conflict if a flight's gate is blocked by a neighboring heavy.

10.4 Scheduler

Resolved the problem of the metering display mode flip-flopping when metering parameters were changed during a bank.

10.5 STBO Client

Added the ability to search for GA flights with callsigns with the format N#####, such as N175DP. In this release, this functionality only works if the tail number has not been set in the flight. It does not work if the callsign and tail number are both set to the same value in the system. This will be corrected in the next release.

Corrected a problem when editing only the runway utilization of an airport configuration which caused flights to not be updated. This has been resolved so that the updated runway utilization is now being correctly applied to affected flights.

Corrected a problem when a fix closure was received from OIS with no alternate fix specified which caused the flight to be rerouted to its closed fix and to not be removed from the scheduler and timeline. This was corrected so that if a fix is received from OIS with no alternate fix specified, the CDR will be set to TBD.

10.6 Surface Metering Display

Updated the order of the metering parameters table so that it matches the tabs, namely, so that 5/23 always shows up first and so that the north runways read as 36R, 36C, 36L.

11 Release 3.1.2.3 / 3.1.2.4 Summary

11.1 Overview

This document describes the changes to the ATD-2 software baseline for versions 3.1.2.3 and 3.1.2.4. Version 3.1.2.3 was not deployed to the field; version 3.1.2.4 was deployed to CLT on 02 July 2018.

11.2 Adaptation

Added gates A21 - A29 to the A concourse. Updated the surface map displays and added the default trajectories.

11.3 Model

Modified the runway assignment logic so that a position-derived runway based on a flight's track data overrides a user-set runway, even if the runway was set for operational necessity. This change helps prevent erroneous user entry of runways on bulk flights from inadvertently changing airport configuration.

Modified the gate conflict logic to detect the case where two flights blocking the same neighboring gate were showing conflicts even if there was no flight at that neighboring gate. For example, if a heavy at D5 or D9 blocks D7, D5 and D9 were showing a conflict even if there was no flight at D7; now D5 and D9 will not show a conflict.

11.4 Scheduler

Removed functionality that allowed the TMAT to be unfrozen after pushback. This solves the problem of a controlled flight with an infeasible release time being given a TMAT after the release time. With the correction, the TMAT will remain frozen even if it is in the past, which serves to provide another indication that the release time is not feasible.

11.5 STBO Client

Added a dialog to prompt the user to confirm the list of flights to be updated when performing an action such as Change Runway that will affect multiple flights. The list of flights presented to the user for confirmation are filtered to remove flights that are: i) in the past, ii) not part of the same configuration as the flight from which this change was instigated when using the right mouse menu, and iii) more than N hours in the future, where N is the time filter on the flights table (currently 8 hours). This change addresses the problem of operational systems toggling the airport configuration automatically due to user entries for runway change instigated by a SEARCH that returned more flights than the user realized.

Updated the ability to search for GA flights with callsigns with the format N##### such as N175DP when the callsign and tail number are both set to the same value in the system.

Corrected an error when filtering arrival flights by gate time.

12 Release 3.1.3 Summary

12.1 Overview

This document describes the changes to the ATD-2 software baseline for versions 3.1.3. Version 3.1.3 was deployed to DFW on 16 July 2018.

12.2 Adaptation

Updated the decision trees for arrival and departure fixes to no longer assign a fix for internal arrivals and departures.

Added the hardstand situated west of terminal E for DFW to the airport map, as well as spots 49 and 51.

12.3 AEFS

Provided the initial deployment of the interface between ATD-2 and AEFS for CLT with this release. NOTE: At present, this interface is not part of the automatic system start-up; it must be launched manually.

12.4 Backend

Made improvements to flight matching.

Made improvements to OIS restriction parsing.

Changed the active configuration monitor to exclude flights with an OpNec-assigned runway.

12.5 Dashboard

Provided the initial deployment of the Dashboard for DFW with this release.

12.6 RTC

Changed logic such that flights will keep the hold clearance even if the flight stays on hold for a very long time. For example, when a flight has been put on gate pushback hold by a ramp controller, the flight will no longer be moved back to the UNCERTAIN group.

Created user profiles for DFW "Terminal ABCD", "Terminal D", and "Terminal E".

Changed the display of closed departures fixes with no CDR from black text on a red background to white text on a red background.

Changed gate labeling such that clicking on a gate label will cycle through all the strips assigned to that gate, drawing a leader line even if the flight is not in the viewable area.

Made gate conflict improvements.

Removed transition back to the UNCERTAIN group for a flight on hold with a TOBT in the past; as a result, RTC will now show a red count-up timer with a red blinking "PUSH". The TOBT count up timer should start from the max of TOBT and start of hold time. (Previously, RTC had been displaying a red count-down timer, which started at 13 minutes and counted down until the flight was put back into the UNCERTAIN group.)

Changed a flight that is constrained by an APREQ program and marked as a "Free Release" on the STBO Client so that the flight's data tag will show the APREQ time as "A:RLSD" with a yellow background. "RLSD" will also display as the release time in the Flight Menu.

Removed the colored background on the data tags of hollow and solid icons (but not strips) so that LOB indicators are more obvious and to reduce clutter.

Changed logic so that changing a runway now requires an OpNec check. Once applied, the runway and OpNec assignment cannot be changed back; a call to ATCT is required.

Added the ability to search for only General Aviation flights by entering "GA" in the Search text field.

Changed logic to automatically replace spaces with underscores as the user enters a file name when saving user settings.

Changed the release time displayed on the data tags and Flight Menu to be rounded to minutes, instead of truncated, in preparation for the TBFM 4.8 roll out.

12.7 Scheduler

Changed logic such that when a ramp controller updates the intended out time of a flight on gate hold by right clicking and selecting "Add X min Hold", then the TMAT is shifted accordingly; previously, only the TOBT was shifted.

Changed ramp controller updates to the intended out time of a flight on gate hold by right clicking and selecting "Add X min Hold", causing the TMAT to be shifted accordingly; previously, only the TOBT was shifted.

Updated the scheduling processing so that a READY flight will maintain a similar schedule priority order as before it called READY. Previously, the READY group had a higher scheduling priority, such that when a flight became READY, the scheduler would schedule it before all the other PLANNING flights. This caused the READY flight to jump forward in the scheduling order that its frozen schedule was based on. Jumping forward in scheduling order typically caused the flight's TTOT to be advanced, which bumped other PLANNING flights backward.

Removed READY flights from swappable options. Previously, READY and PLANNING flights were included as available swappable flights in the priority's algorithm. However, if a swap occurred with a READY flight, the READY flight was put on hold if it was not in the pushback/taxing state. If a flight was swapped with a flight on hold, the new swapped schedule was not reflected on the holding flight's

schedule. Both the priority flight that swapped with the READY-flight and the READY-flight were using the same TTOT, resulting in queue ballooning.

Set the TTOT to max (UTOT, CTOT) by the scheduler, so that a visual indicator can be displayed to alert the controller that the flight will be late to its CTOT. Previously, in the Ramp Area, a controlled flight's TTOT was scheduled to be as close as possible to its CTOT (EDCT time or APREQ release time). When a controlled flight with a release time was late (e.g., its UTOT > CTOT), the flight's previous TTOT became unrealistic.

Triggered the scheduler to rerun as soon as possible (after allowing any current scheduler run to finish) if the users change the metering mode, metering parameters, or affirm/reject a DMP.

12.8 STBO Client

Added the ability to search for only General Aviation flights by entering "GA" in the Search text field.

Changed logic to automatically replace spaces with underscores as the user enters a file name when saving user settings.

Changed the release time displayed on the timeline, flight table, and map to be rounded to minutes, instead of truncated, in preparation for the TBFM 4.8 roll out.

Changed the heavy indicator on the timeline for CLT to display the H in gold reverse video.

Made multiple changes to the Taxi List:

Moved the Taxi List settings to their own settings window, accessible by clicking the icon in the top left corner of the Taxi List window.

Changed the Taxi List title bar to reflect the current Taxi List settings.

Changed the order of the runways displayed for CLT so 18L/36R is on the left.

Included the Taxi List settings in the user's preference file.

Changed the time interval field from free-text to a drop-down menu with options for 15, 30, 45, and 60 min.

Updated the Arrival Count (when displaying based on a time interval) to count all arrivals projected to be in the TRACON within the time specified, instead of only counting arrivals currently in the TRACON.

Changed software to allow the user to edit OIS-source TMIs on the TM Actions panel. When edited, the data source changes from OIS to USER.

Added a new "MIT" column with the value of a flight's MIT to the Flight Table.

Changed software to display the runway assignment with a caret preceding the runway in a Client's data tag (e.g., "^18L") if a runway change was entered via the scratch pad on TBFM.

Added a right mouse menu option to mark a flight as 'free release'. The option is available for any flight that is constrained by an APREQ program. When set for a flight, the flight's datablock will show the APREQ time as "A:RLSD". In the Flights Table, the APREQ State column will show the state as RELEASED.

When a flight is set as free release, all of the previously scheduled release times will be cleared out of the flight table, datablocks, flights strips, and database. To cancel the free release, right click the flight on the timeline and select 'Cancel APREQ' from the popup menu. The flight's datablock should revert back to showing "APREQ" indicating that the flight is constrained. In the Flights Table, the APREQ State column should show UNSCHEDULED.

Surface Metering Display

Added handling to allow the user to use the backspace, delete, and arrow keys when setting runway parameters.

12.9 TBFM

Changed TBFM's arrival scheduler function that governs the order of consideration for arrivals to now schedule the flights in runway ETA order instead of meter fix crossing order.

12.10 TTP

Updated TTP to conform to the Build 2 specification and readied it to publish TTP data to SWIM R&D for CLT.

13 Release 3.1.4 / 3.1.4.1 Summary

13.1 Overview

This document describes the changes to the ATD-2 software baseline for versions 3.1.4. Version 3.1.4 was deployed to CLT on 23 July 2018.

13.2 Adaptation

Updated the Exx taxiways into the west ramp, based on the new concrete that was added.

13.3 RTC

Changed time-based metering so that PLANNING flights will display # if the best available OUT time is more than 10 minutes in the future. Once the best available OUT time is within 10 minutes, the advisory will be displayed. If the user clicks on the # when the OUT time is more than 10 minutes in the future, an advisory will be displayed based on the currently assigned TOBT.

Added WHS option in the Flight Menu when a user clicks the Reposition checkbox for CLT. When applied, the flight strip will move to the west hardstand and have a yellow border.

Added an option to the Flight Menu to freeze the TOBT and TMA of a PLANNING flight with a TOBT. Flights with frozen advisory times will have the advisory countdown shown as black on cyan, and in the Flight Menu the TOBT and TMA times will be highlighted in cyan.

13.4 Scheduler

Added flights to the PLANNING group, to now include any non-GA departure with an LOBT or EOBT in the next 8 hours or a GA departure with an EOBT in the next 8 hours. It also disabled the pushback request that was sent to the scheduler upon a "#" click.

Changed the scheduler to freeze a flight's TOBT and TMA if it receives a manual freeze message from the RTC.

Changed how the scheduler determines priority order from using SOBT to using STOT = SOBT+unconstrainedTaxiTime, which is the same as the generally accepted common understanding in the TFDM community.

13.5 STBO Client

Changed map display so that multiple TRACON maps can now be displayed.

Changed software so that users can now enter new TMIs (APREQs, MITs, Ground Stops, Departure Fix Closures, Runway Closures) from the TM Actions Panel with start times in the past. (Note: new TMI entries that overlap times with a TMI for the same resource currently in effect will still be blocked by the TM Actions Panel.)

14 Release 3.1.4.2 Summary

14.1 Overview

This document describes the changes to the ATD-2 software baseline for versions 3.1.4.2. Version 3.1.4.2 was deployed to CLT on 31 July 2018.

14.2 AEFS

Added a message from AEFS to ATD-2 which signifies that AEFS has removed the strip for a particular aircraft from the AEFS system.

Corrected an error where the AEFSFuserBridge was setting the arrival airport to the destination ICAO airport code.

14.3 Backend

Updated the Fuser mediation rules to favor RTBFM scratchpad runway assignments over SWIM.

14.4 RTC

Reverted the RTC flight strips to have a background color.

Updated the display of new spots 1-7.

14.5 Scheduler

Updated a configuration parameter so that arrival flights with no RTBFM STA will be pushed out 30 minutes instead of 60.

14.6 TTP

Corrected the count of cancelled flights.

Modified the airport configuration change to send the new current configuration in a single message.

Triggered a TTP flight data message to be sent with the runway_assigned value (set to the user assigned runway) if a user changes a runway in STBO.

Updated metrics calculations to include more accurate Queue Waiting Time Accuracy and Metering(Ready)TimeCompliance values in OperationalMetrics messages. No functional changes to the user.